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INCREMENTAL DEVELOPMENT OF NAVY STANDARDS FOR PROJECT SUPPORT ENVIRONMENT INTERFACES; A WHITE PAPER

Carl Schmiedekamp - Chairman and Editor
Next Generation Computer Resources Program
Systems and Software Technology Department (Code 7033)
NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION WARMINSTER
P.O. Box 5152
Warminster, PA 18974-0591

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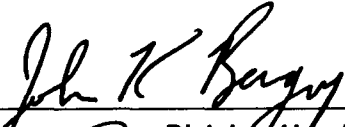
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13. ABSTRACT (Maximum 200 words) The Project Support Environment Standards Working Group (PSESWG) of the Navy's Next Generation Computer Resources (NGCR) Program, was formed to select and formalize Navy interface standards for Project Support Environments. The interface standards are to be widely available (i.e., non-proprietary) and, if possible, widely utilized within industry. While the final PSE interface standardization is to be completed in 1998, there are PSE interface standards that can be used for procurement purposes before that time. The purpose of this paper is to articulate initial thinking regarding the approaches available to providing interim specifications along the way to the final Navy standard for project support environment interfaces. Several approaches are discussed and the approach recommended is to produce multiple draft standards with "Fast Track" official recognition and then produce a final, Project Support Environment Interfaces standard for the Navy.				
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1. Introduction

The goal of the Next Generation Computer Resources (NGCR) Program is to provide the standardization of Navy mission critical computer interfaces and computer component interfaces. With these standardized interfaces, industry will be better able to provide computing resources that meet Navy needs. The interface standards are to be widely available (i.e., non-proprietary) and, if possible, widely utilized within industry.

Project Support Environment Interface (PSEI) standards, the subject of this paper, are standards which are essential to the timely and cost effective acquisition of the majority of the next generation of Navy mission critical computing systems. PSEI standards will assist the Navy in efficient acquisition and use of Project Support Environments (PSEs) which address a wide range of performance levels, compatible computing service levels, and functionality levels. The Project Support Environment Standards Working Group (PSESWG) was formed to select and formalize Navy standards for Project Support Environments.

The high level plans of the PSESWG can be summarized by this quote from one of the PSESWG cochairs:

"We plan to identify all interfaces of potential interest and then to narrow down that list by assessing availability of candidates and payoff for standardization. We will then address each interface we choose to standardize by developing requirements, identifying candidates, and selecting one based on an evaluation process" - Tricia Oberndorf

The existing PSEI specifications are at various levels of standardization. They range from evolving research implementations to international standards. While the final PSEI standardization is to be complete in 1998, there are PSE interface standards that can be used for procurement purposes before that time.

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The purpose of this paper is to articulate initial thinking regarding the approaches available to providing interim specifications along the way to the final Navy standard for project support environment interfaces.

2. Scope

The NGCR interface standards, while being incrementally developed, are to be sufficiently in place so that the Navy can begin acquiring systems utilizing those standards by 1998. Other working groups within the NGCR program have produced a single Navy interface standard for a particular technology. The PSESWG may produce a single standard or perhaps a collection of standards for different aspects of PSEs possibly along with a profile standard which combines the collection of interfaces into an integrated whole.

The period of PSEI standards development began in FY91 and continues through FY98. The initial selection of baseline specifications for the PSEI standard will be available for use in acquisitions no later than FY95.

The PSEs of concern are intended to support application projects regardless of scope, platform and life-cycle phase.

This discussion is primarily focused upon the process of developing a Military Standard (MILSTD) PSEI, however it is expected that a companion Military Handbook (MILHBK) will also be produced. The MILHBK may actually be the larger document and require more PSESWG effort to produce.

3. Issues

In this section we discuss the major issues involved in choosing a process for producing the Navy standard(s) for project support environment interfaces. The major issues considered are: 1) the number of different documents to be put through the military standardization process, 2) the number of times each document should be formally revised and re-standardized, and 3) the process of selecting interface specifications for inclusion in the standard(s).

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3.1. One Standard vs. Multiple Standards

The NGCR PSEI standard is not necessarily a single standard as the other NGCR working groups are producing. The NGCR PSEI "standard" could be a collection of Navy/DoD standards developed or adopted over the life of PSESWG. Multiple standards will require a significant effort for each standardization process but would produce early documents which can be used in procurement and produce visibility of PSESWG within the community.

A problem with any incremental approach to the NGCR PSEI standard is that the early interface specification selections may be incompatible in some ways with those specifications selected later. This will require careful engineering to achieve a final standard that is of high quality and is generally compatible with the early PSEI standard(s).

3.1.1 A Single PSESWG Standard

The procedural effort will be reduced to the minimum if there is only one version of one standard produced. The major problems with having only one standard are that the working group efforts would not be available to people doing procurements until the end of the PSESWG project and that there is likely to be little non-Navy recognition and support of the working group. Without a visible early product it is unlikely that significant non-Navy participation can be maintained in the working group. Many organizations cannot afford to support participation for such a long range project without visible results.

3.1.2 A Single Early PSESWG Standard with a formal revision at the end of the project

PSESWG could plan to do the standardization activity twice, once for an early set of interface standards and then again at the end of the project. The early set of interfaces would be those that are currently mature and which the consensus of the members of the PSESWG agree should be part of the NGCR PSEI standard. As each of the remaining interface areas is worked to select between competing interface specifications and to mature the selected specification to standard quality, selected specifications would be

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included in a series of draft revisions to the standard which would be made publicly available for review. This approach would provide early help for those projects procuring a PSE before the final NGCR PSEI standard is produced. This approach would also give guidance to people doing early procurement on the directions being considered to fill in the major "gaps" in the early standard. This approach should also give visibility and lend importance to the PSESWG project so that participation in the project will remain high.

There could be more than one formal revision to an early standard; with each revision being a closer approximation to the final NGCR standard. This would be more useful to the people doing procurement incurs the cost of additional standardization processes.

3.1.3 Multiple Drafts plus "Fast Track" Recognition

PSESWG can produce a series of publicly released drafts of the final standard. The public drafts would be officially recognized by some "Fast Track" process. A Fast Track process would require minimum effort from PSESWG members but would give recognition to the list of interface specifications in our draft standard or to the standard itself. This approach would reduce the procedural effort required for standardization to that of one full standardization effort plus the effort to gain official recognition via the fast track.

The official recognition of the list of interface specifications or of the draft standard itself will give clear guidance to people doing procurement. This approach will also provide feedback from early users of the interface specifications so that the working group will be able to produce a better final standard. The main disadvantage of this approach is that the standard itself will not be an official document until the end of the project.

There are several avenues available for getting Fast Track recognition of an NGCR PSEI standard. The official recognition may not be of the PSEI draft standard directly but may be recognition of only the individual interface specifications in the NGCR PSEI standard with references to the draft standard. The expected Fast Track approach is to produce the draft PSEI standard (and handbook) in the form of a technical report (TR) out of a Navy laboratory. The TR will then be sent to the NGCR Program Office for its approval. With program office approval the technical report will be sent up the "Chain of

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Command" for approval with perhaps the issuance of a Navy/SPAWAR Instruction to officially recognize the draft standard. In addition to the attempt to receive policy backing for the draft standard we would provide visibility within the environments and Navy communities by wide distribution of copies of the TR and by presentations at technical meetings.

3.1.4. Multiple NGCR PSEI Standards

The PSESWG can produce individual Navy standards for individual interfaces or groups of important PSE interfaces. The early standards would be available for use in procurement before the end of the PSESWG project. Most of the earlier standards would not need to be revised and therefore programs that started early using some of the NGCR PSEI standards would not be stuck with "out-dated" standards.

There are many disadvantages of having multiple NGCR PSEI standards. The major disadvantage is the significant effort needed for each of the standardization efforts. The standardization process requires preparation of the document in the proper format, getting Navy approval for submission as a standard, sending copies to a large number of entities & individuals for review, processing of all the corrections & changes requested by the reviewers, perhaps a second cycle of distribution, review and update and then final DoD approval as a standard. The standardization effort typically requires two years to complete. Producing a large number of individual Navy standards would require a tremendous effort.

Having multiple standards will make it difficult to describe the necessary relationships among the interfaces although that information could be placed in handbooks for the users and implementers. Another disadvantage is that writing Navy policy for the use of the standards will be more difficult. A final "Umbrella" standard that references all the individual interface standards could solve the policy problem but would require still more effort from PSESWG.

3.2. Selections of Baseline Interface Specifications

With the foreseen level of effort from the PSESWG it appears that it will not be possible to achieve formal specifications for all important PSE interfaces. However, we

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can plan to achieve formal specifications for those areas which are important to the Navy and have mature technology. In focusing the effort of PSESWG we must plan which interface areas are to be worked and in which order. Considerations in making the plan are the importance of standards for the particular interfaces, the applicability of the interface specifications to Navy needs, the availability of specifications, the maturity of specifications, the acceptance of specifications by industry and the effort required to mature the available specification to standards quality.

Two prioritizations of interface areas are needed if there is to be an early standard or an early draft of the standard. The first prioritization would be used to select those interface specifications which would be included in an early NGCR PSEI draft standard and the second prioritization would be used to plan the long range activities of the PSESWG.

The selection of interface specifications for an early standard should only consider those non-proprietary interface specifications which are mature, have industry acceptance, meet Navy PSEI needs, are expected to be common technology for the next 10 years and which have the consensus support of the members of the PSESWG. One way to produce this list of specifications is to ask PSESWG members to "nominate" candidates and then go through a structured evaluation and selection process. Another source of candidates for the early standard could be to base the initial set of interface specifications on the selections made by other organizations such as STARS.

One approach to generating the long-range standardization plan is to produce a candidate list of significant interface areas of a PSE, and then evaluate each area for importance, availability, maturity, effort required etc. From the highest ranking interface areas we would select candidate interface specifications that can be matured within the time and effort constraints of the PSESWG. A plan can then be produced where work is scheduled on the different areas, as needed, to have all the selected specifications formalized by the end of the PSESWG project.

4. Recommended PSESWG approach

The recommended PSESWG approach is to produce multiple draft standards with "Fast Track" official recognition and then produce a final, official NGCR PSEI standard.

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An emphasis of the early draft standards is to make available to the Navy something useful as soon as practical and to get early feedback on its usefulness.

This approach will require the production of a list of proposed interface specifications for the initial draft PSEI standard. Then the working group as a whole will need to evaluate the standards and select those interface specifications that should be included in the initial draft standard. The evaluation process will require a clear statement of the goals and requirements of the NGCR PSEI standard. It should be the task of the Approach Subgroup to produce such a general goals and characteristics document. The specifications for the initial standard will require less detailed technical evaluation than those in the later standard. These early selections should pose no major technical questions and have no competing candidates; if this is not true then the corresponding interface area should be reserved for later revisions of the draft standard after further study by PSESWG.

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Steve Howell
10901 NEW HAMPSHIRE AVE.
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SILVER SPRING MD 20903-5000

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NAVSWC
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